

REMARKS

Claims 1-7, 16 and 23-28 are now pending. Claims 1-7, 16 and 23 have been amended. Claims 17-22 have been canceled. Applicant requests reconsideration and reexamination of the pending claims.

Claims 1 and 3-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Carson (USPN 4,476,094). Claims 2, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson in view of Gadgil (USPN 5,284,519). In addition to arguments stated in response to the first Office Action, Applicant again overcomes the rejections as follows.

Applicant respectfully directs the Examiner's attention to Carson, col. 2, lines 59-66, in which it is explained that the object of the invention in Carson is "to provide a means of reducing hydrogen usage in hydrogen consuming hydrogen recycle processes by reducing the amount of hydrogen vented. The concentration of hydrogen is obtained and used to adjust the flow rate of the vent stream so that the concentration of hydrogen is at the minimum required to protect the catalyst and/or maintain the yield structure." Carson then goes on to disclose using a flow restriction device in the vent conduit to increase or decrease the concentration of hydrogen in the recycle stream. (See col. 8, lines 12-25) Carson fails to disclose

Carson and the invention as set forth in Claim 1, differ in that Carson does not teach or disclose "separating a non-purified hydrogen gas from said exhausted gases; venting said exhausted gases free of said non-purified hydrogen; purifying said non-purified hydrogen gas to generate a purified H₂ gas; and thereafter introducing said purified H₂ gas into said reactor along with additional vapor-phase chemicals including pure H₂ gas into said reactor with sufficient supplied energy to cause a second reaction in said reactor."

After the first reaction, exhausted gases are routed through a separator, which is used to separate the non-purified hydrogen from the other "exhausted gases." The remaining exhausted gases, which are free of hydrogen are vented. The remaining non-purified hydrogen is purified and thereafter re-introduced into the reactor to be used in a subsequent second reaction.

Carson discloses a system, which attempts to limit the amount of hydrogen being vented from the system, but does not teach or suggest that the exhausted hydrogen should not be vented, but instead purified and reused as set forth in Claim 1.

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In addition, it is clear from FIG. 1 of Carson, that Carson does not disclose requiring that the hydrogen be purified prior or after reaching the reactor. Instead, Carson discloses that much of the hydrogen in the system is vented.

Accordingly, since Carson does not teach or suggest features of Claim 1, Claim 1 is allowable over the cited references.

Claim 2 has been re-written into independent form. Claim 2 sets forth the reaction comprising "depositing a thin film layer on a substrate positioned in said reactor." Applicant respectfully requests that the Examiner reexamine Gadgil, which the Examiner has indicated discloses thin film deposition that uses gas flow in and out of a reactor.

Applicant submits that the combination of Carson and Cadgil to arrive at Applicant's invention as set forth in Claim 2 requires hindsight and can only be considered obvious in view of Applicant's invention disclosure and claims. The Examiner has not pointed to any language or other disclosure in Carson or Cadgil, which teaches, suggests or would otherwise motivate one of ordinary skill in the art to combine a reference associated with "conservation of hydrogen in... processes used in oil refineries and petrochemical plants" and a reference associated with a reactor used for thin film deposition. Accordingly, Claim 2 is allowable over the combined references.

For reasons similar to those given for Claim 2, Claim 24 is allowable over Carson in view of Cadgil.

Claims 3-7, 16 and 23 depend from Claim 2 and are allowable for at least the same reasons as Claim 2 as well as for the novel features which they add. Claims 25-28 depend from Claim 24 and are allowable for at least the same reasons as Claim 24 as well as for the novel features which they add.

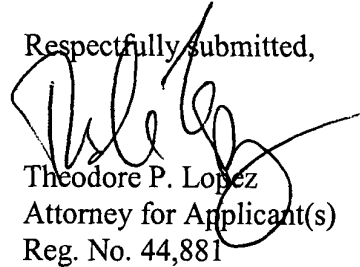
CONCLUSION

For the above reasons, pending Claims 1-7, 16 and 23-28 are now in condition for allowance and allowance of the application is hereby solicited. If the Examiner has any questions or concerns, the Examiner is hereby requested to telephone Applicant's Attorney at (949) 752-7040.

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Respectfully submitted,



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ATTACHMENT A

1. (Twice Amended) A process for recycling a vapor-phase chemical comprising:

introducing vapor-phase chemicals taken from the group consisting of NH₃, N₂O, SiF₄, SiH₄, TiCl₄, N₂, Ar, HCl, and SiCl₄ and including pure H₂ [a first] gas into a reactor with sufficient supplied energy to cause a first reaction in said reactor;

exhausting gases from said reactor resulting from said first reaction;

separating a non-purified hydrogen [second] gas from said exhausted gases;

venting said exhausted gases free of said non-purified hydrogen;

purifying said non-purified hydrogen [second] gas to generate a purified H₂ [third] gas; and thereafter

introducing said purified H₂ [third] gas into said reactor along with additional [said] vapor-phase chemicals including pure H₂ [said first] gas into said reactor with sufficient supplied energy to cause a second reaction in said reactor.

2. (Amended) A process for recycling a vapor-phase chemical comprising:
introducing vapor-phase chemicals including a first gas into a reactor with sufficient supplied energy to cause a first reaction in said reactor;

exhausting gases from said reactor resulting from said reaction;

separating a second gas from said exhausted gases;

purifying said second gas to generate a third gas; and thereafter

introducing said third gas into said reactor along with said vapor-phase chemicals including said first gas into said reactor with sufficient supplied energy to cause a second reaction in said reactor, [The process of Claim 1, wherein] said first and second reactions including [comprises] depositing a thin film layer on a substrate positioned in said reactor.

3. (Twice Amended) The process of Claim 2 [1], wherein said first gas comprises pure H₂.

4. (Twice Amended) The process of Claim 2 [1], wherein said second gas comprises non-purified H₂.

5. (Twice Amended) The process of Claim 2 [1], wherein said third gas comprises between about 80% to 90% of the quantity of said pure H₂ introduced in said reactor.

6. (Amended) The process of Claim 2 [1], wherein the sufficient supplied energy comprises an RF low frequency power energy level of between about 0.318 watt/cm² to about 3.18 watts/cm².

7. (Amended) The process of Claim 2 [1], wherein said reactor comprises a tapered outer shell surrounding a tapered susceptor.

16. (Amended) The process of Claim 2 [1], wherein said third gas comprises purified H₂.

Please cancel Claims 17-22.

23. (Amended) The process of Claim 2 [17], wherein said vapor-phase chemicals comprise gases selected from the group consisting of NH₃, N₂O, SiF₄, SiH₄, TiCl₄, N₂, Ar, HCl, and SiCl₄.

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